Ready to launch Apollo 14 Sunday on 10-day lunar mission

This Sunday afternoon Apollo 14 is scheduled to be launched from the Kennedy Space Center in Florida.

Ten days later, on Tuesday, February 9, the three astronauts aboard the Command Module are scheduled to splash down in the Pacific.

In between those dates there'll be some "coasting" to and from the moon. But the heart of the mission will be the two extended periods for Extra-Vehicular Activity (EVA) when Spacecraft Commander Alan Shepard Jr. and LM Pilot Ed Mitchell get a first-hand chance to explore part of Fra Mauro and its rugged terrain . . . as Command Module Pilot Stuart Roosa goes 'round and 'round the moon in a fairly tight orbit.

This will be the second shot at Fra Mauro. Last year's try failed—though it proved the capability of LM Aquarius to serve as a "lifeboat" to bring its three-man crew back home to earth. If last year's Apollo wasn't perfect, Aquarius made up for the critical deficiency.

More important, perhaps, was what happened during and after that Apollo 13 flight: A somewhat blase public was jarred into realizing that space missions are not easy, routine events to be taken for granted—and the men and women who build the ships now see even more keenly the need for near perfection. If, as some contend, the so-called man-in-the-street has less ardour for space pioneering, that lack has been made up for by the intensified determination of the spacecraft builders to create a "perfect" craft.

That drive toward perfection has manifested itself at Grumman. As reported January 15 by Chuck Kroupa, Grumman's director of Operations at the Cape, the only "problem" thus far is the absence of any problem. Now, just prior to launch, Kroupa says, "Everything's going quite well. It's a real good bird, and we're watching it like a hawk."

Grumman Vehicle Director Tom Carpenter mirrors Kroupa's confidence.

This launch has a rather narrow "window"—that is, a time frame within which a launch from the Cape can result in an on-target landing point on the moon's surface under proper light conditions for the crew. The window is there from 3:23 p.m. to 7:15 p.m. (EST). If missed, the flight would be delayed until March. But no one is thinking about a March mission.

(There's a little bonus tucked into this Sunday's manned mission: The big

(Continued on page 8)

plane
GRUMMAN
news

Fleet gets Grumman EA-6B, Navy's newest ECM aircraft

There's a big welcoming party planned for today at the Naval Air Station at Whidbey Island in Washington State that will draw some high Navy and Grumman officials. They'll be at the West Coast training site for carrier air crews to mark the introduction of the Navy's newest electronic warfare aircraft—the Grumman EA-6B—into Fleet service.

The EA-6B, a derivative of the A-6A, has a four-man crew and carries advanced electronic equipment for automatically detecting and degrading enemy radar systems.

Early this month, the newest Intruder was pronounced fit and ready for carrier duty following a week of intensive sea trials aboard the U.S.S. Midway. The Navy scheduled the trials to evaluate the general compatability of the EA-6B with the operating carrier environment, to determine minimum requirements necessary for safe catapult conditions, and to assess various other EA-6B flying characteristics to assure safe operations from a carrier.

It was the final—and perhaps the most critical—series of tests the EA-6B had to undergo before it went into Fleet service. Because it was so important, Grumman sent a full team of engineers, flight test, production, and quality control personnel to assist in the operational support of the plane. Heading that crew were Bob Miller, Vice President and EA-6B Program director; Don King, deputy director on the EA-6B; Ken Moser, EA-6B flight test manager; and Lou Popovich, EA-6B vehicle project engineer.

But Grumman was aboard only in a support role. In charge of the trials was Lt. Cdr. Bob Johnson, who heads up the carrier suitability branch at NATC. Lt. Lee Tillotson, Navy project pilot on the EA-6B, flew the plane during the trials.

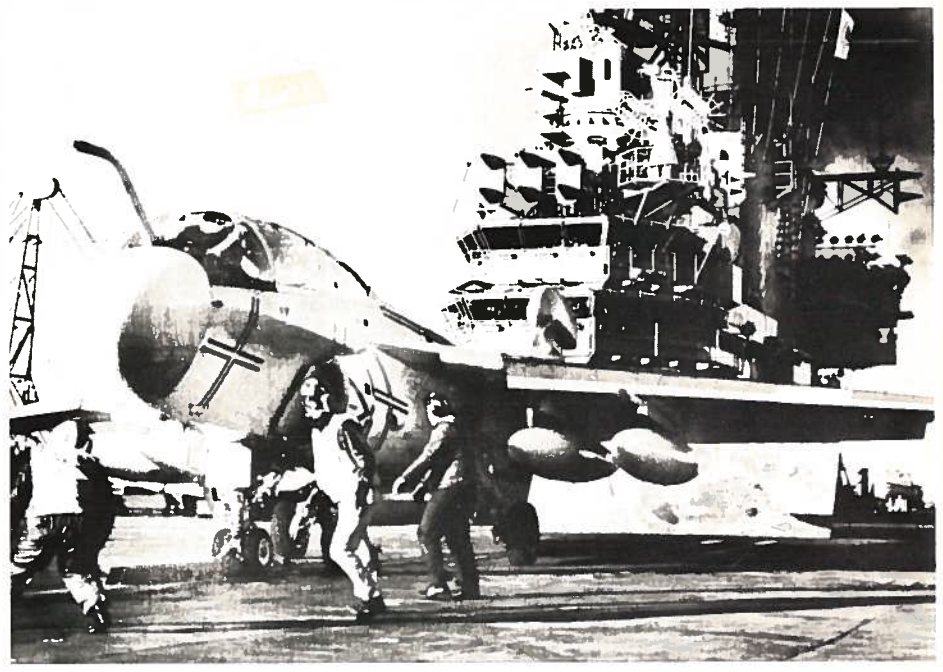
And how did it go? Following a week of carrier trials, which included 22 catapult take-offs and 22 arrested landings under various aircraft loadings and configurations, Lt. Tillotson remarked:

"Well, you've done it again. You've got another good one!"

There were no serious problems encountered during the tests—in fact, the arrested landings and catapult launches indicate that the EA-6B will have better carrier performance than the A-6A due to better pilot visibility and an improved wing design.

"It was a real charge to witness such outstanding performances by the aircraft, the Navy, and our own people," said Miller on his return to Bethpage.

(Continued on page 2)



Sea trials. **Launching crew hurries to ready Grumman EA-6B for nose-tow catapult from U.S.S. Midway during recent sea trials off West Coast. EA-6B, Navy's newest electronic warfare aircraft, was rated 'go' for Fleet service. (Photo by Fred Annette)**

Fly first E-2C, next generation in AEW defense

The Navy's latest Airborne Eearly Warning aircraft, the E-2C Hawkeye, completed its first flight the afternoon of January 20—one month ahead of schedule. Jim Philbin, Grumman assistant chief test pilot, and Dick Van Allen, co-pilot, flew for two hours "with a high degree of confidence, before and during the flight," to quote Philbin. (He may be a little prejudiced, having been closely associated with Grumman's Airborne Early Warning aircraft for almost a decade.)

The new Hawkeye is the third in the E-2 family of carrier-based aircraft designed and built by Grumman. E-2C carries an entirely new avionics system incorporating the latest advances in the field. The Navy likes the E-2 family to the extent of $152 million, the amount of the development contract awarded to Grumman since June 1968. The E-2A made its maiden flight in 1960.

What is the Hawkeye's main mission? Fleet or task force protection, says Tom Guarino, E-2 Program director. It can detect and track both friend and enemy, and then it can direct the interception from its place in the sky. Normal mission altitude is approximately 25,000 feet and 200 nautical miles from the carrier, from where cruise missiles, surface vessels, and low flying aircraft can be pinpointed if they should attempt to slip below the carrier's protective radar screen. Airborne interceptors can be either automatically or voice commanded to target from the E-2 air-to-air data link.

"The Navy's offensive and defensive weapons systems are designed to rely on the E-2 umbrella," Guarino says.

A major improvement in the E-2C is its ability to detect targets over land as well as over water. This proves to be significant in Vietnam, where operations close to land generated a requirement for target detection over land and near land. Grumman expended 690 flight test hours and developed the hardware and detection techniques required to provide this overland detection capability.

(Continued on page 2)

Vol. 30, No. 2, Bethpage, N. Y., January 29, 1971

New pension ruling big assist to those seeking early retirement

A new improvement in the Grumman Pension Plan was announced last week by Clint Towl, Chairman of the Board, following a meeting of the Grumman Board of Directors. It affects those men and women, ages 60 to 65, who may choose to retire early. Their new pensions will be substantially higher than before.

"We have had this under study for a long time," Clint Towl said. "At Pin Presentation meetings you have often told us you would really like to retire early but couldn't afford to. Now we feel we have made early retirement more attractive — and practical — for those with a desire or need, because of health or other personal reasons, to take advantage of it."

Booklet to come

A booklet describing the new pension plan will soon be distributed, and the Statement of Benefits that is mailed to each employee each year will state the personal pension figures for each individual. To give you an idea of how the improved plan will work: a 60-year-old who formerly would have received about $65 per month may now, retiring at 60, receive $100 a month for the rest of his life. Another person of 60, who by reason of longer service or a higher wage bracket would have received $325 per month, will now get $500 per month for the rest of his life.

Each individual's pension differs, depending on years of service, pay rate, and age at retirement, so these figures are merely a guide.

This change is retroactive to December 31, 1970. It favorably affects also those who are between the ages of 50 and 60 with 20 years' service. If they decide to retire they will get higher pensions than before.

Clint Towl made the point that an employee who continues working until 65 will of course build up a higher pension than one who retires early.

The Grumman Pension Plan, which is financed entirely by the Company, has been amended a number of times to make retirement a time of greater enjoyment through financial independence. Only last September the Directors announced that pensions being received by Grumman retirees would be adjusted to the Consumer Price (cost-of-living) Index, subject to a maximum of 3% per year. That adjustment in pension checks became effective October 1, 1970, and will be made annually in the future.

Other benefits

A year ago, the Directors gave a vested right to a pension to anyone who leaves Grumman's employ, for any reason, after completing 10 years of service with the Company.

Clint Towl's answer to those who have asked, "Why can't I personally contribute to the Pension Plan?" is, "the Grumman Employee Investment Plan." Over 14,000 Grummanites are voluntarily enrolled in this, regularly setting aside some money through payroll savings. The Company contributes a percentage in Grumman common stock. However, for the Pension Plan, the Company contributes the entire amount.

The new booklet will explain the working of the Pension Plan in greater detail.

F-14 report

F-14A No. 1 crashed December 30 basically because of hydraulic systems failures.

That's the heart of the report made by Senior Vice President Grant Hedrick, who headed Grumman's investigating team.

A Navy accident board has been studying the crash, too, and a statement of findings is anticipated soon. That will probably come from Rear Adm. Tom Walker, Commander of the Naval Air Systems Command, Washington, D. C.

The Company's study indicates that **both** primary hydraulic systems failed. In addition, the electrically-powered Back-up Flight Control Module, which supplies power to the rudders and stabilizers only, did not perform adequately, resulting in loss of control of the aircraft. The probable cause of that failure was either a lack of hydraulic fluid or an internal leak that resulted in insufficient output of pressure.

Examination of the wreckage showed that two ¼-inch titanium hydraulic lines, located behind the main landing gear, broke, crippling the flight control system. Metallurgical study of the lines and subsequent ground tests indicated that the break was caused by pressure fluctuations that create resonant vibrations in the lines; eventually, they cause fatigue breaks.

The Company is now working on ways to prevent these vibrations and assure the integrity of the back-up system. The changes will be incorporated in F-14A No. 2. The Company believes that no major redesign work will be necessary.

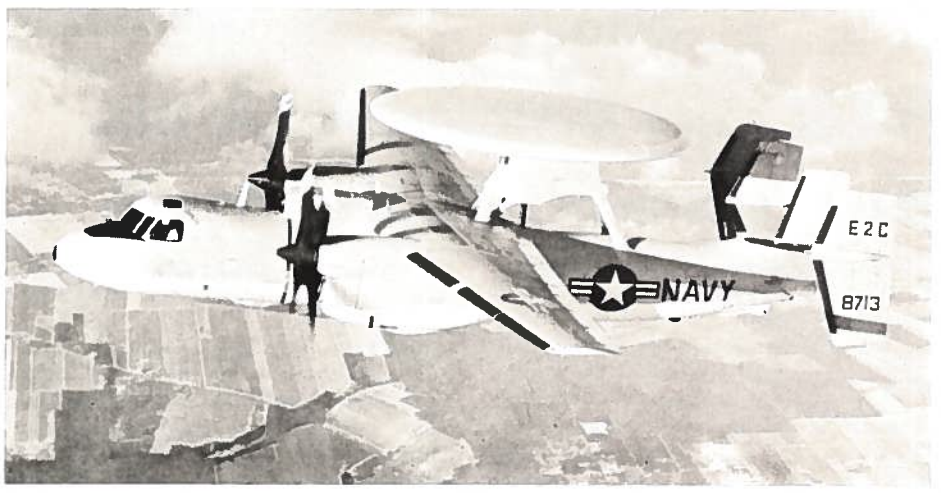
Erroneous statements have been made in the news media concerning specifics of the crash, design changes, costs, and schedules, according to the F-14 program office. Until the Navy publishes a statement, definitive information will not be available. At press time, Plane News lacked that information.

Fly E-2C, new 'umbrella' defense for Fleet

(Continued from page 1)

This plane, with a saucer-like rotodome typical of all E-2 aircraft, has a lot of flexibility. In addition to its AEW abilities it can, under any weather conditions, vector or precisely guide aircraft to a target; this is known as Strike Force Control. Its Air Traffic Control capability consists of guiding aircraft, again under all-weather conditions, through desired "corridors" to provide collision avoidance, air-to-air rendezvous, and landing sequences. It's the traffic cop. It looks for planes if they get lost. It has data links for relay of radio messages from the carrier to more distant points. Because it monitors all friendly forces within its surveillance volume, emergency signals from any friendly aircraft are recognized immediately and, if bail-out or crash landing action is required, a rescue vehicle can be directed to the precise spot where the action occurred.

Production will begin at the Calverton Facility in mid-1971. Meantime the M-1, the second development E-2C aircraft, is scheduled to have its first flight in March. A flight program on the two development airplanes will continue through mid-1973.



First flight. **The Airborne Early Warning E-2C development aircraft completed two hours of test flying on Jan. 20—a month ahead of schedule. (Photo by Dick Sander)**

The E-2C staff is generous in its praise of the "great cooperation" shown by everyone who has worked on the plane in Plant 4. "A high degree of professionalism" is Philbin's comment on the effort that got the E-2C into the air a month ahead of schedule.

CALENDAR of events

Notice of events for period Feb. 12 - 26 should reach Plane News by **Tues., Feb. 2.**

Amateur Radio Club: Wed., Feb. 17, 5 p.m., WA 2LQO shack, roof of Plt. 5. Bus & oper. mtg. Emmett Goodman, Ext. 87125.

Amer. Inst. of Aero. & Astro.: Wed., Feb. 17, 6 p.m., Four Seasons C.C., Woodbury, dinner mtg. Gen. Lundquist, Dept. Admin. R&D, FAA. Mrs. J. Smart, 595-3086.

Amer. Soc. for Metals: Wed., Feb. 10, Holiday Inn, Plainview, cocktails 5:30 p.m., dinner 6:30 p.m., mtg. 8 p.m., L.I. Chap. Geo. Pellessier, E. Fullam, Inc. on "Fractography using Scanning Electron Microscope & Microprobe." R. Maller, Ext. 7351.

Aquatic Assoc.: Tues., Feb. 2, 7:30 p.m., Larkfield Suburban Club, Larkfield Rd. & Clay Pitts Rd., E. Northport, swim. Five free swims to new members joining before Feb. 2. 935-8584.

Duplicate Bridge Club: Thurs., 5:45 p.m., Plt. 3 Cafe, reserv. not required, partnerships arranged. Pete Harrington, Ext. 1812.

Fencing Club: Fri., 5 p.m., Plt. 30 Cafe., competitive fenc. & instruc. Joe Campisi, Ext. 1134.

Flying Club: Fri., Feb. 5, 5 p.m., Plt. 28 Audit., reg. month. mtg. Mal Gerry, Ext. 1396.

GAA Leathercraft Club: First & third Wed. of month, Plt. 28 Audit., instruc. in leathercraft, new ideas & tech. Cy Dotz, Ext. 86828.

Horseback Rid. Club: Every Sun. For infor., Donna, Ext. 86214 or Caren Carlson, Ext. 2725.

Pure Bred Dog Club: Mon., Feb. 8, Plt. 18, 8:30 p.m. John Byfield, Pres. Smithtown Sec. Sight, on "Training of Seeing Eye Dog," guests welcome. C. T. Williamsen, Ext. 3076.

Rod & Gun Club: Wed., Feb. 24, John's Oasis, Hazel St., 8 p.m., gen. membership mtg., Walter Schillinger, Ext. 57-617.

Soccer Club: Sundays, weather permitting, Reserve team 12:30 p.m., Premier team, 2:30 p.m., league & cup competition, spectators welcome. Karl Herrnkind, Ext. 84181.

Soc. of Plastics Ind.: Tues. - Fri., Feb. 9 - 12, Shoreham Hotel, Wash., D.C. National, Eng. papers exhibit, spkrs. G. Lubin, Ext. 1717.

Stamp Club: **(Bethpage)** First 3 Wed. of month, 5 p.m., Plt. 30 Cafe, swapping, circuit bk. sales, auctions. Marty Harow, Ext. 9172.

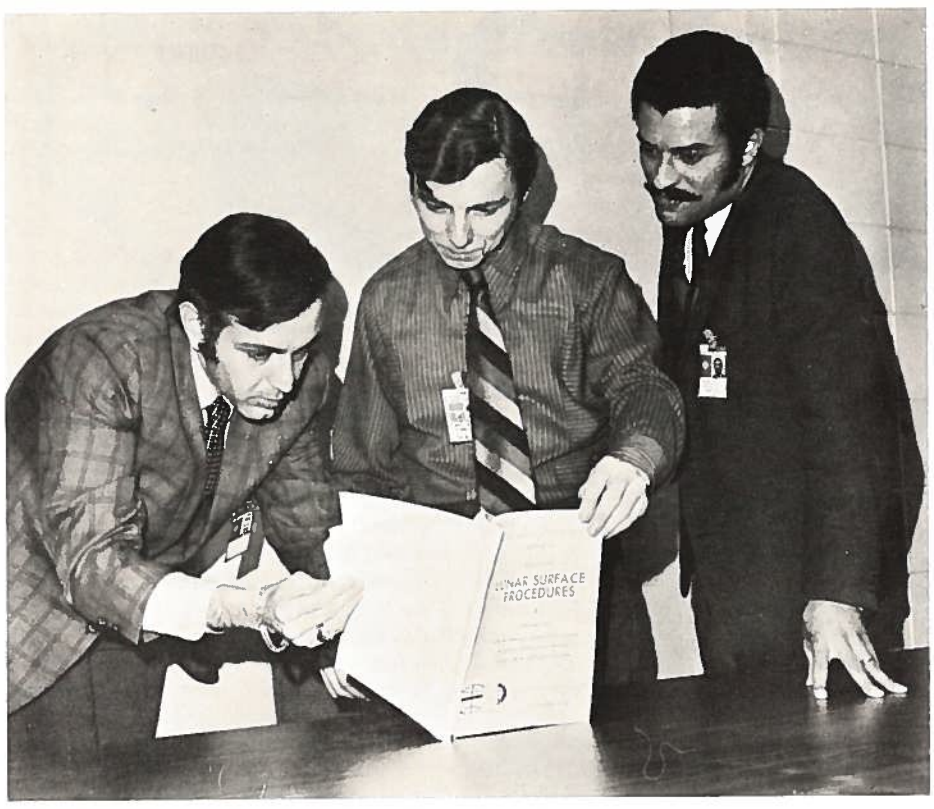
Sea trials . . .

(Continued from page 1)

"The only apparent foul-up was a minor failure in one of our slat-track rollers, a mechanical fitting on the leading edge of the wing. Our Field Service people got on the job, located a replacement part at North Island, got it flown aboard, and we were back in business.

"The Patuxent Navy people turned in a thoroughly professional performance, and the smooth handling of the ship by Capt. Gene Carroll and his crew after a prolonged stay in port was particularly impressive."

And now the EA-6B is in business. The first production aircraft is scheduled to be accepted today in ceremonies at Whidbey Island, and plans call for the delivery of one EA-6B a month for the first year. At present, total production is expected to be 42 aircraft, with delivery to continue through 1973.



Behind the scenes. Dick Bassano, Gary Morse, and Vince Holder (L to R) brush up on expected happenings on lunar surface to aid TV newsmen in explaining activities during Apollo 14 mission. (Photo by Nat Scherer)

Stand-in astronauts find role challenging, but no glamor job

You watch them on TV during manned space missions . . . say, Jules Bergman of ABC, or Walter Cronkite of CBS, or Jim Hartz of NBC. You're impressed by their knowledge, by their professional approach. And that's as it should be: They **are** pros.

Yet none of them would claim that he can do the job—especially the highly technical parts—all by himself. Quite the opposite. Each knows he often has to lean on the expertise of people who wrestle at first hand with the intricacies of making a mission a success.

So, the newsmen draw from documents, interviews, simulations, **and** in-house experts. Some of these Grumman experts appear on TV once in a while, such as Scott MacLeod, who helps out CBS. Others are behind-the-scenes information sources.

Grummanites Dick Sprague, Vince Holder, and Gary Morse are on the consulting team for ABC, and Dick Bassano and Gerry Gibbons man the ropes for NBC. They'll all tell you, it's not a glamor job.

Holder says, "After standing around in a space suit for a few hours, and now and then acting out what the astronauts are doing off camera, you wilt."

"I've lost about eight pounds each time I've gone through that," Bassano remarked.

"And then there's the job of filling blank spots," comments Morse. "Say you've taped, beforehand, parts of a mission and there's an actual, live change—and there you are trying to fill in for the taped sequence. It can be tough."

Even tougher is trying to give an accurate answer to the newsman on TV, especially when the question might bear on non-technical areas. "We try to be direct," Gibbons says, "but there are times when you have to check first with the Company."

"If we don't know the answer, we say so, and get what they need as soon as we can," Sprague says. "We've found they're tolerant. They're good people to work with."

plane GRUMMAN news

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Ad notice

Sorry, folks. There were so many items competing for space in this issue of Plane News, that the ads, along with a few stories, got squeezed out. See you next issue.

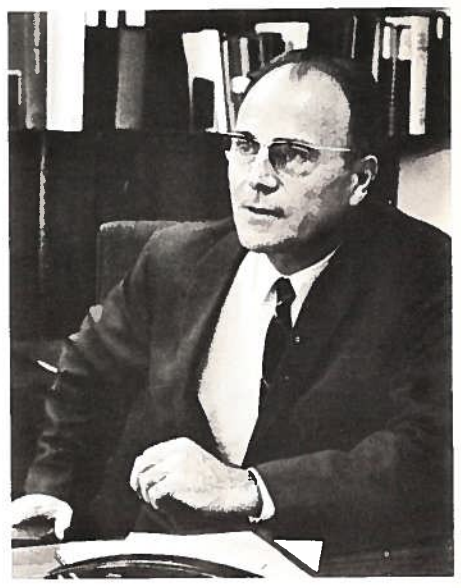
Hedrick gets top aerospace honor for vehicle design contributions

The American Institute of Aeronautics and Astronautics presented its Sylvanus Albert Reed Award to Senior Vice President Grant Hedrick Wednesday at the AIAA Honors Banquet in Manhattan. It was presented, the citation said, "for technical excellence, design innovation and leadership in the structural development of several generations of aerospace vehicles." A certificate and a money award of $500 went with it.

The AIAA annually presents this award for "a notable contribution to aeronautical engineering design or the aeronautical sciences resulting from experimental or theoretical investigations which have had a beneficial influence on the development of practical aeronautics."

Besides being director of Technical Operations, Grant Hedrick is also a Director of Grumman Aerospace Corporation. He came to Grumman in 1943 as a stress analyst, having been a structural engineer for a large private engineering firm and then for the U.S. Army Engineering Department.

He rose to be chief of Structures, and he held that post until 1957. From then until 1963, when he became a Vice President, he was Grumman chief technical engineer. His contributions to structural design and to the concept of balanced, sound education for engineering students have been outstanding. He has received many awards, including the 1967 ASME "Spirit of St. Louis Award."



Grant Hedrick

Tennis is his special avocation, an interest he shares with his son Karl; they are nationally ranked in the U.S. Lawn Tennis Association father-son ratings. The Hedricks, who have another son, Ira Grant III (Bing), live in Freeport.

Pre-flight check. Maj. Gen. John Klingenhagen took time out during inspection trip to Stuart facility in Florida to get in a little flying, Mohawk style. He's shown here with Maj. Dave Amaral (partially hidden) preparing for flight in the Army's OV-1D.

Presentations lists new posts, film hours

There's been a change in the scheduling hours at the Grumman film library. If you want to call and reserve a NASA or Grumman film, you must call Ext. 86919 or (516) 433-2313 between 8 a.m. to 12 noon, Monday through Friday.

There is a great variety of NASA and Grumman motion picture films available from the film library, located at Aerolog Productions on Stewart Avenue in Bethpage. The films may be borrowed by Grummanites and by various civic groups, schools, professional societies, etc., **free.**

In Presentations Services, Sam Koeppel has been named assistant manager and Dick Clark, business manager. Both report to manager Dick Milligan. Reporting to Koeppel will be Harry White, supervisor of editorial services; Ed Okon, supervisor of graphics and production services; and Dan Benn, supervisor of vendor liaison. John Budney is assistant business manager.

J. H. Argust
St. Pts. Assem.

G. C. Stevens
Fuse. Mid

A. S. Albiston
Cost Proposal

W. A. Seward
Tool & Die

F. E. Boyce
Machine Shop

J. W. Burkhardt
Parts Paint

V. Matuza
Final Assem.

E. W. Cox
Parts Control

E. S. Whitlock
Surfs. & Assem.

Heavy with talent, January service roster includes 25 marking quarter-century here

Grumman's monthly anniversary list is getting top-heavy with talent and long service. Look at all the oldtimers on the January roster: two completing 35 years, 19 with 30 years; 25 with that notable quarter-century; an unusually large group of 20-year people (68), and 64 with 15 years.

The two marking 35 years are Joseph W. Zureck of MP & P Manufacturing Cost Proposal, Plant 1, and Arnold I. Martin, Technical, Plant 55, Savannah.

The 30-year men are:

PLANT 2: Joseph Prochaska, asst. foreman, Small Parts Fabrication; Peter A. Keda, Steel Parts Assembly; Albert A. Hand Sr., Fuselage Tail; Harold A. Truran, asst. foreman, Ordnance.

PLANT 5: Frederick W. Buck Jr., asst. foreman, Machine Shop; Albert W. Hallock, Structural Designers; Louis B. Wehle Jr., Production Engineering Management & Staff.

PLANT 11: Victor Robinson Jr., Manufacturing Engineering Tool Fab Management.

PLANT 12: Francis J. Savarese, T/M Engineering RL Design.

PLANT 25: Fred G. Smith, Configuration Data Management.

PLANT 30: Freeman W. Barnes, Accounting Administration.

PLANT 34: William C. Leiber, P/S Factory Support; Carl E. Anderson, Structural Designers; Wilbur L. Korrow, Power Plant Design.

PLANT 35: William D. Craig Jr., Mechanical Systems; Edmond C. Rabut, Program Management - Ocean Systems.

PLANT 36: Robert V. Benito, Program director, TACRV

PLANT 83: John M. Morrison, KSC LM Operations Management; Harry C. Henshaw, KSC Manufacturing Shops.

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And these 24 men and Dorothy Daniels are heading into the New Year with a tidy 25 years of service to Grumman:

PLANT 2: John H. Argust, Steel Parts Assembly; Grover C. Stevens Jr., Fuselage Mid; Alexander S. Albiston, MP & P Manufacturing Cost Proposal; William A. Seward, Tool Fab - Tool & Die; Victor F. Kney, Manufacturing Engineering T/M Management.

PLANT 3: Franklin E. Boyce, Machine Shop; John W. Burkhardt, asst. foreman, Parts Paint; Vincent Matuza, Final Assembly; Edward W. Cox, asst. foreman, Production Control - Parts Control.

D. J. Murphy
Support Equip.

R. E. Petter
Prod. Contr.

J. J. Ridulfo
Hydraulics

A. V. Kesler
Standards Lab

R. J. Pankratz
Sub. Mgt.

A. R. Slavik
Facil. Mtce.

F. L. Kunkel
Fiberglass

W. E. Burnett
Nacelles

R. F. Indence
Material Contr.

PLANT 5: Edward S. Whitlock, Surfaces & Assembly; Donald J. Murphy, Support Equipment Production; Rudolph E. Petter, Production Control - Records & Release.

PLANT 7: Joseph J. Ridulfo, Hydraulics.

PLANT 12: Allen V. Kesler, Measurement Standards Lab.

PLANT 15: Robert J. Pankratz, Subcontract Management - F-14.

PLANT 25: Albert R. Slavik, Facilities/Management.

PLANT 27: Frederick L. Kunkel, Fiberglass; William E. Burnett, Nacelles.

PLANT 30: Ralph F. Indence, Critical Material Control; John B. Akerman, Requirements Planning; Dorothy N. Daniels, GDS Digital Computing.

PLANT 33: Lloyd E. Henniger - Inspection - Support Equipment.

PLANT 34: Nicholas Genega, Electrical Design.

PLANT 35: Warren B. King, Mechanical Systems Structural Analysis; Frank A. Jagger, Systems Safety.

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Two women and 66 men complete 20 years with Grumman this month:

PLANT 1: Albert Adams, Fluid Power; Louis J. Salvatorelli, Structural Analysis; John P. Engel Jr., Drafting Quality Assurance.

PLANT 2: George P. Winkler, Tanks & Ducts; William G. Webster, Support Equipment Production; Raymond Aliperti, Out-of-Production Spares; William R. Paul, Production Budgets Manpower; Raymond L. Metz, Plant Management & Staff; Gordon A. Mitcher, T/M Engineering Methods Manufacturing LIA Spares; John L. Giordano, Plant Stores & Distribution; Charles F. Robertson, Facilities Maintenance; Thomas E. Casey, Facilities Maintenance; Louis J. Culmone, Inspection - Mechanical.

PLANT 3: Edward J. DeMeo, Press; Bernard Ricci, Machine Shop; Nicholas LaPorta, Heat Treat; Edward C. Quimby, Honeycomb Final; Eugene A. Ross, Machine Operating - Parts Control; Percy Knight, Facilities Maintenance; Cecil Felton, Facilities Maintenance; Alexander S. Kertesz, Inspection - Mechanical.

PLANT 4: Frank P. Tate, Electronics Test; Albert J. Hauser, Inspection - Mechanical.

PLANT 5: Bernard Kolar & George W. Hervey, Machine Shop; David C. Murray, Propulsion Installation; Maurice S. Watson, Plant Stores & Distribution; Norma Rooney, Corporate Service Management & Staff; George Mulholland, Facilities Maintenance; Richard H. Imgram, Systems Technology Management & Staff.

PLANT 6: Frank C. Schwab, Instrument Test; Billy H. Penix, Avionics Instrumentation; William I. Cummings, Production Control - Records & Release; John E. Duffus, Tool Fab - Templates; Claus L. Von Glahn, P/S Verification & Product Support; Kurt F. Uhle, Eugene F. Hudson, Edgar W. Ritchie, Adrian Vanderburght & Albert Panuska, Facilities Maintenance; Gerard F. Norton, Maintenance Industrial Control; Harry W. Jackson, Plant Protection.

PLANT 7: Anthony Podejko. Electronic Flight Development Operation; Edward J. Gagne, Production Control - Configuration Control.

PLANT 8: Eugene W. Miller, Inventory Control.

PLANT 12: Joseph W. Drauch, Metallurgical & Chem Lab.

PLANT 14: James G. Seaman, Facilities Maintenance.

PLANT 15: Robert W. Kress, Program Management - F-14A.

PLANT 17: Harry J. Karaus, Receiving Inspection.

PLANT 18: Charles H. Rhatigan & Patrick Foley, Plant Protection.

PLANT 25: William C. Tappe, Advanced Technology.

PLANT 30: Joseph P. Lennon, General Purchasing; John M. McNamara, Maintenance Administration; Frederick J. Piwowar, Facilities Maintenance; Eileen Toomey, Materials Accounting.

PLANT 33: William C. Eissler, Instrument Test; Henry J. Nalenc, Avionics Fab.

PLANT 35: John A. Wood, Facilities Maintenance; William H. Hohn, Contour Development; John C. Schultz, Seats & Survival.

PLANT 36: Renard S. Pearson, Environmental Control Design.

PLANT 41: Woodrow W. Bauer, GDS Business Programs.

PLANT 77: Frederick S. Baron, Material.

PLANT 80: Walter R. Schmersal, P/S A/C Systems Service.

PLANT 83: Denovan (Deke) Jones, KSC Engineering.

PLANT 88: Edwin M. Von Essen Jr., Engineering.

(Continued on page 5)

Muench, Marine-Ocean Systems head, sees 'wet world' expanding

Walter Muench, program manager on the research submersible Ben Franklin, has been named director of Marine/Ocean Systems. His duties will involve the "wet world" at Grumman—that is, hydrofoil, civil and military submarines, and oceanographic activities.

Muench says the wet world is ever-expanding. Likening it to a vast, unchartered continent, he points out that man, although he has lived on and near the sea and has used it for transportation and has tapped its food and mineral wealth for centuries, still knows relatively little about it—much less technologically than he knows about going into space, for example.

It wasn't too long ago that many veteran oceanographers were predicting that a total national commitment to explore inner space, if accompanied by the same zeal and financial infusions that spurred the space program, would guarantee results at least as important as placing man on the moon.

Calls for national priority

But that commitment never developed. Although expenditures for oceanographic investigations by civil government have expanded from $200 million to more than $500 million over the past five years, Muench feels that figure falls far short of what is necessary to provide the nation with the knowledge, technology, and hardware for such a monumental effort.

Examining the total ecology of the sea must have high national priority, Muench insists, and should that national effort be initiated, much of the technology and systems management gained in aircraft and space programs can be readily applied to the task.

"But the sea is a hard taskmaster; it's a completely different world from our own atmosphere or outer space—and a lot less forgiving."

Although it seems likely that the nation is not yet ready for such a commitment, Muench does see potential military, commercial, and civil markets in the near future.

Promising markets

Although the commercial oil market is a "tough nut to crack," he listed that among some promising areas for examination in the next couple of years. It's an enticing field. The oil industry already spends more than $2 billion yearly in offshore prospecting and construction. As more and more wells are drilled farther from shore, Muench says that the opportunities for using submersibles in oil exploration, construction, and pipeline repairs are increasing.

The military submersible market also holds promise for the future, he feels. Some areas now under investigation by Marine/Ocean Systems include:

- Advanced submarine design concepts
- Submarine comunication systems problems associated with subs while under way
- Coordination of various submarine subsystems, such as life support and internal communications
- Undersea launched long-range missile system

And in the civil field, the need for monitoring and control of pollution on our nation's coastal waterways is a critical necessity, Muench says. It's possible to do the job right now, with more "borrowed" space technology—advanced instrumentation that can take samples and make real-time evaluations of the water's pollutants and possibly identify the source of foreign matter.

Using a research submersible for an undersea classroom laboratory holds unique possibilities, Muench points out. Could there be a better place than a submerged habitat to make biological and geological investigations while studying the eecology of the ocean?

With government grants for certain types of research and expenditures by civil governments likely to increase in the next few years, the competition for the oceanography dollar is getting keener. Already in the field are many of the top aerospace firms—Boeing, Lockheed, North American, General Dynamics, Westinghouse, and General Electric.

"That's stiff competition," says Muench. "But we've never allowed that to discourage us in the past. Why should it now."

Before joining the Company in 1959, Walter Muench was in charge of the Nuclear Components section of Foster Wheeler Corp., where he was responsible for the original design and development of many of the high-pressure vessels and heat exchangers associated with the Navy's nuclear fleet. At Grumman he was first associated with the Carrier Suitability group. Later he was OAO test director in charge of dynamic testing of the stabilization and control system to be flown on the current generation of OAOs. Prior to joining Ocean Systems in June of last year, Muench was an assistant program manager in charge of all sub-contracts associated with OAO here at Grumman. In Ocean Systems, he served as engineering manager.

Walt Muench

Retirees elect officers

The Grumman Retiree Club zips along in a cheerful frame of mind under the guidance of these officers for 1971: Rudy Trefny, president; Ralph Siegel, vice president; Freda Lund, secretary; Irving Sloter, treasurer; Bob Thorne, sergeant-at-arms.

January service roster heavy with talent

(Continued from page 4)

PLANT 94: George A. Smith, P/S Support Equipment Services.

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Three women and 61 men will tally up 15 years with Grumman in January:

PLANT 1: Vito Santora, Prototype; Carl F. Cooke, Fuselage Forward; Thomas J. Reidy, Facilities Maintenance; William T. Ross, Project Planning.

J. B. Akerman
Require. Plan.

D. N. Daniels
GDS

L. E. Henniger
Inspection

N. Genega
Elec. Design

W. B. King
Struct. Anal.

F. A. Jagger
Systs. Safety

PLANT 2: William H. Degnan, Small Parts Fabrication; John Bernal, Drop Hammer; Fred L. Welge, Steel Parts Assembly; Joseph J. Gaffney, Center Section Final; Robert Diamond Jr., Production Control - Parts Control; Raymond J. Warenik, MP & P Manufacturing Cost Proposal; Stanley J. Zolek, Facilities Maintenance; George Yerk, Presentation Services; Thomas Coker, Inspection - Mechanical.

PLANT 3: Nils D. Pearson, Machine Shop; John Nicastro, Spotweld; Donald A. Scheulen, Wing Sub-Assembly; Albert J. Koch and Kai Andersen Jr., Honeycomb Pre-Fit; Wilbur A. Jeanson, Facilities Maintenance; Rae F. Morrill Jr., Inspection - Mechanical; Robert K. Barth, QC Quality Engineering.

PLANT 4: William F. King, Flight Operations/ Gulf. O & R.

PLANT 5: Henry Moravec, Support Equipment Production; Albert E. Ure, Contracts A/C; Mary Flacksenburg, Executive Secretary.

PLANT 6: Francis J. Zahra, Prototype; Frank J. Becker, Avionics Instrumentation; Adolph R. Koltzow, Plant Stores & Distribution; Leonard L. Smith, Vehicle Production Engineering; Harry T. Dolan Jr., Plant Protection; Edward P. Cantrell, GDS Real Time System Program.

PLANT 7: David G. Call, Crash Crews.

PLANT 11: Robert F. Kwiatkowski, Tool Fab - Plastic Tooling.

PLANT 12: Peter Kleckowski, Facilities Maintenance; Robert Galagaran, Metallurgy & Welding Engineering; Alfred Zacchia, Measurement Standards Laboratory.

PLANT 14: Francis A. Merrick, Advance RF Technology.

PLANT 15: Victor C. Ehmig, Configuration Data Management.

PLANT 17: Joseph J. Ferrari, Shipping & Spares Consolidation.

PLANT 18: Henry Kelley Jr., Whitney R. Blohm & Frank L. Dunn, Plant Protection.

PLANT 25: Harry E. Valentine Jr., Engineering Administration; Ronald W. Betts, Space Programs Staff; Isabelle E. Miglio, Advance Space Programs.

PLANT 27: Matty Bosch, Parts Paint; Edward W. Lombardi, Fuselage Sub-Assembly; Philip Yuncker, Paint Stores & Distribution.

PLANT 30: William V. DeLongis, Machined Parts/ Raw Material; Reginald E. Von Rhee, GDS Digital Comp. Operations.

PLANT 33: Howard J. Jepson and Peter Rezanka, Avionics Assembly; Elliot E. Blond, P/S Servo Engineering & Training Development.

PLANT 34: Victor E. Lindgren, P/S Design Engineering.

PLANT 35: Stanley S. Ramsden, P/S Program Management; Jarvis Leng, Fluid Mechanics; Joseph A. Jeransky, QC Inspection Management.

PLANT 36: James M. Edgerton, Fuselage Minor Assembly.

PLANT 39: Michael A. Marcari, S/CAT Engineering.

PLANT 41: Joan Hermges, Reproduction Services.

PLANT 57: Edward R. Stepnoski, P/S, A/C Systems Service, Cherry Point.

PLANT 77: John J. Hart Jr., Plant Protection, Savannah.

PLANT 83: Harold R. Tilley, KSC Manufacturing Shops.

'Super' Intruder on the way as last A-6A wings out of Calverton

The last A-6A is gone—but it won't soon be forgotten. No. 488, the "caboose" or final ship in the A-6A line, was accepted by a Navy crew from Attack Squadron 35 on December 28 and flown from Calverton to the Naval Air Station at Oceana, Va.

Unlike some of its less fortunate contemporaries, however, the A is departing the scene only to make way for a newer, and superior, model in the A-6 line. And its successor, the A-6E, promises to gain a following at least as vocal as the original Intruder.

But what an "act" to follow. The A-6A has been referred to as:

"The plane for all seasons" — Time Magazine; " . . . Powerful new punch in attack carrier operations"—Adm. Horacio Rivero; " . . . Finest attack airplane in the world today"—Capt. (then Cdr.) Swoose Snead.

It wasn't always that way. With her bulbous nose and unpretentious lines, the A-6A is hardly a beauty queen. And since she had been billed as the first **true** all-weather attack aircraft, there was naturally a horde of unbelievers—on all sides—when the Intruder first took flight, in 1960.

On target

After the A-6A joined the Fleet for combat carrier operations, and flew with the Marines in Southeast Asia, that all changed. Whether flying alone on night sorties or acting as "pathfinders" during combined missions, the Intruder proved it could hit its target any time, any place, in all types of weather. And certain "spinoffs" of the original A-6A have been just as successful. The B and C versions, for example. They were introduced specifically to suppress surface-to-air missiles sites and to interdict enemy supply routes at night. The KA-6D, another modification, is providing the Fleet with a new aerial tanker.

And what of the future? The next-generation Intruder, the A-6E, is an updated state-of-the-art version of the A-6A. Although they look the same, the next version of the Intruder comes equipped with a new radar—a single unit that combines both the track and search radars of the A—that will provide A-6E air crews with a much more defined "highway in the sky" for their attack mission. In addition, the E will have a new computer, weapons release system, and video tape recorder, all of which incorporate a self-test capability.

Most important, it works. That was proved last November during a full-systems flight—one month ahead of schedule. Those test flights are continuing to further evaluate radar and complete weapons system performance. Navy Preliminary Evaluation trials are scheduled for this May, and the big one—Bureau of Inspection and Survey trials—is expected in September.

While the testing continues, production is on the move too. A-6Es are scheduled to start rolling off the line with regularity this year, with the first delivery scheduled for August. And then the pace will quicken so that 12 can be transferred to Navy squadrons the first year.

On her way. **Chief Test Pilot Bob Smyth (he flew the first and the last A-6A) makes it official as he says goodbye to Lt. Cdr. Bob Covey (C) and Lt. Ray Atkins before they flew away final ship on A line. Below, Calverton production crew takes time out to say goodbye. (Photos by Dick Sander)**

Wind up United Fund appeal as 24 win prizes

"I thought they were putting me on. . . . "

So said Vivian Knussman on January 21, when friends called to tell her that her name was the first one picked in the United Fund drawing. She hadn't been in the Plant 3 Cafeteria when Vice President Jack Rettaliata drew the stub from the big drum. She? A winner? Come, now!

Then a call came from Kay Zuk of Employee Services. "And do you know what?" she said the next day when the winners gathered to choose prizes, "I still can't believe it!"

Somewhere along the line, though, she and 23 other winners became believers as they met in Plant 30's dining room and divided the "spoils" that came from contributing to a very worthy cause.

After Rettaliata drew out number one, Augie Walsky dug in and called out the name of another gal, Frances Cipriano. Then the brief era of female dominance came to an end.

Not that that mattered, really. By the time the lucky two dozen made their selections, there was a kind of warm camaraderie and light spirit in the air . . . the unmistakable ease of a winner.

The 24 winners and their prizes are listed below.

25-inch stereo color TV combination

2. Frances Cipriano, Plant 5—GE 24-cubic-foot refrigerator

3. Alexander McAslan, Plant 27—Sylvania 25-inch color console TV

4. Henry Frantzen, Plant 3—GE 25-inch color console TV

Smiling. **Vivian Knussman and Frances Cipriano show Alexander McAslan what happiness is after they had been selected for U.F. prizes. (Photo by Jim Wagner)**

5. Alfred Horeis, Plant 1—Sylvania stereo console

6. Frederick Caretto, Plant 1—RCA 23-inch color TV

7. Reginald Knopf, Plant 36—Magnavox 19-inch color TV

8. Nicholas Maroulis, Plant 34—Sony AM-FM stereo

9. Malcolm Donnelly, Plant 34—Magnavox stereo

10. Rita Baffa, Plant 25—Sylvania 18-inch portable color TV

11. Joseph Romanoski Plant 24—Westinghouse refrigerator

12. John Matthews, Plant 2—GE upright freezer

13. Edward McClenin Jr., Plant 34—GE Americana electric range

14. Joseph Kern, Plant 1—GE Port-a-color TV

15. Dominick Chico, Plant 6—GE 18-cubic-foot frost-free refrigerator

16. Harry Hills, Plant 8—GE stereo component system

17. Vincent Jambrone, Plant 15—Polaroid camera

18. John Maloney, Plant 30—GE undercounter dishwasher

19. Dwaine Edwards, Plant 15—GE 23-inch B/W console TV

20. Wallace Walsh, Plant 30—Frigidaire Skinny-Minni combination washer-dryer

21. Nat Lazzara, Plant 2—GE automatic washer

22. Arthur Froelich, Plant 5—GE 23-inch B/W table model TV.

23. Harold Dunham, Plant 38—16-inch portable B/W TV

24. Delane Andrews, Plant 55—Westinghouse automatic clothes dryer

OBITUARIES

Plane News has received word that death has come to the Grumman personnel listed below. We extend sincere sympathy to relatives and friends.

ROBERT J. STOCKS of Maintenance, Plant 12, died January 11 at the age of 60. He had been with the Company since 1962, and his home was at 56 Shore La., Bay Shore.

FRANCIS KLEIN of Fuselage Forward Assembly, Plant 1, died January 12. He was 55 years old and had been with Grumman 19 years. He lived at 139 Periwinkle Rd., Levittown.

HARRY L. HAMILTON JR., foreman of Drop Hammer, Plant 2, died January 13 at the age of 58. He had completed 32 years with the Company. He lived at 59 Dunlap Rd., Huntington.

FORTUNATO R. (Fred) D'AMICO, foreman of Instrumentation, Plant 5, died January 19 at the age of 36. He had been with the Company 18 years. His home was at 230 Willard Ave., Farmingdale.

FRANK J. DI COSTANZO of Parts Paint, Plant 3, died January 21 at the age of 55. He had been with Grumman since 1961. His home was at 10 Kenneth Ave., Bellmore.

Corrigan forges record 657 to take over Aerospace laurels

Wrong-way Corrigan was somewhat of a misdirected celebrity a few years back, and the world (well, Grumman Aerospace League at least) should know that there's a **right**-way Corrigan now. His name's Dick, who scatters pins for the ninth-place Idiots. His deserved fame came at the expense of kegler Ed Lomot, one of the league-leading Foul Four. Ed once held the individual high-series title, 629. That flew away as right-way Corrigan smashed through the wood with 200-244-657. And that 244 was only one pin away from the high-game mark set by . . . yep, right-way Corrigan.

Other rollers were doing a fair job in Aerospace, too. Randy Dorn had a not-so-bad 220-223-591, and Ed Bader had a 232, Bill Dodge a 220, and Lou Trapani a 212.

At some other alleys there was talk of excluding John Betterino on grounds of professionalism. (Not really, but are all of his evenings spent on the lanes?) On two successive Wednesdays big John battered the 10 wooden ones as though they were enemies of the State. First he banged out 243-617, and followed it up with 233-647. These came in the Black League, where some others were pin-scattering quite well: Frank Weber had 216-608, Lee Maggio a 227-603, and Joe Glasser hit 219-612 in one session, while Len Maniscalco piled up 207-205-600 the next week.

That man again

Betterino was around in the Masters, too, but he didn't have it all his own way. There was a red-hot tussle as Bruce Karen and Mike Internicola each scorched the lanes with three over-200 games. Somebody grabbed a computer and it fed back, Karen, 206-212-212-820, and Internicola, 203-206-208-819. Hot, too, was Jack Nielsen with an 809. In individual highs came Betterino, 231, Ed Gabriel, 225, and Ike Washington, 223. A wek later, Vin Crevoiserat won the plaudits for Masters wood-spillers with high single, 247, and high series, 856. Sid Kaufman spun a 225-767 and Nielsen popped 224-782. Betterino bashed out a 225 single but fell short of the 760-series group.

In Grumman Brown, Rick Hachemeister's round ball toppled enough pins to win him top spot at 213, and an R. named Clickner rolled high series, 591. Neither effort challenged Lipari's records, 257 and 622.

The Jets still sit atop the Trader league, but there are strange things happening: The Seconds have dropped to third and the Trouble Shooters need trouble-shooting as the league's doormat. And no one seems to be on a hot streak. Closest run at Al Moser's league record of 245 came a couple of weeks ago when Frank Nelson put a 235 on the board. High the following week was Jim Day's 231 and Al Stevens' 585 series. . . . Records in the Red League—267 for George Eyring of Sterling Four and 669 for Stan Domagala of Overruns—seem as safe as an investment in U. S. Savings Bonds. Highs for the week were Bill Breehl's 218 and Red Rottmann's 206-195-605. Other good scores were Bob Nielsen's 194-202-578, Dick Dirocco's 193-205-564.

Locke hits 635

Some creditable pin-bumping in the Classified circuit: Preston, 234-223-630, Azzarello, 222-202-609, and Bowden, 235-607. . . . Judge Locke still has the key in Nite Owl hooting, blowing down the squat wooden ones with 229-214-635. Lots of guys were in the 200-or-above category: Louie Sanfilippo, 226; Bob Zeltman, 224; George Zajac, 215; Gene Piwowar, 213; Harry Haase, 210; Howie Strohl, 204; Ernie Jenkins, 203; Hank Kwiatkowski and Joe Kolinek, 200.

In Woodbury Mixed, Herb Pirkl and Ronnie Leschik copped individual highs with 245 and 200, respectively. Ronnie showed again in high series with 504. Al Vasta's 551 led the men. High team series belonged to the Mixers (2,002) and high team game was owned by the Grumlaners (758). . . . The hero in Syosset Mixed was steady Ed Miron who set a record single 263. That came in his first game of the night. It must have unnerved him; progressively, he followed with 236 and a less-steady 184—but it added up to a hefty 683 high series. Congratulations, Ed! On the same night in the same league, Rita Mathia ran a 223 and ended with a 573 series.

Round up

High games and high series in Patchogue were captured by Lois Haas (184) and Bob Geer (210), and Lois again (518) and Dave Struller (549). Perched rather high in the eight-team league—in first place, in fact—is the squad (Get ready!) Doing Our Thing. . . . Steve Cominski's 257 and 605, along with Ella McMillan's 179 and 437, topped the Wednesday Night Mixed scores. There were some fine singles: 222 by both Lou Argento and Ed Gabriel, 220 by Don Thomson, 214 by Sig Bienkowski, 212 by Pete Jordan, 210 by Al Loduca, and an even 200 by Bob Terry, as Barbara Betts hit 170 and Annie McClee scored 165. . . . Good games in Monday Mixed included Donna Lawrow's 202 and Marianne Lawson's 212, Art Clemente's 237 and Joe Anckner's 251. In series play, leaders were Lawrow's 537 and Pat Anckner's 569, Hank Cenkner's 561 and Joe Guissari's 637.

Holiday date

There's a holiday weekend in your future. According to word from President Lew Evans, "This year, Washington's Birthday will be observed on Monday, February 15, 1971. All plants will be closed, and all personnel actively employed will be paid for that day."

That's the new trend—more long weekends. Nice for skiing, or possibly a quickie to Bermuda.

Ski trip

A last big ski weekend has been scheduled by GAA for Friday - Sunday, February 26 - 28 at Roaring Brook Ranch, Gore Mountain, in the Adirondacks. The cost, 3-4 in a room, is $54.75; two in a room, $59.75. A bus accommodating 45 will leave from Plant 3 at 5:30 p.m. February 26.

Gore has eight lifts, including a new 2½-mile gondola. The tariff covers all transportation, snacks on arrival, ski instruction a minimum of two hours daily, free use of ski equipment, entertainment and dancing nightly, all tips and taxes, use of indoor pool, tobogganing.

Call Chet Baumgartner at the GAA office, Ext. 2133, for reservations.

Karen leading in pin trials

Bruce Karen moved up from third to first place in the second round of bowling rolloffs. Consistency, capped by a 230 game, was his not-at-all-secret weapon. His total pinfall is 2,341 after 12 games.

Ike Washington retained his second-place position. His big wood-knocker was a 225. And that effort was a full 30 pins **under** Fred Alban's 255, though Alban dropped to third spot. George Ulrich hung on to his number four spot. The big leap was by Ed Hilbert, scrambling from 37th position to fifth. Four over-200 games helped—a lot!

The rolloffs next week will be limited to the top 32 keglers. The week later, it'll be tighter: just 20. The men's varsity pin trials continue January 30, at Mid Isle Lanes, Hempstead.

Road Runners flatten Propulsion

Gertrude Stein probably never played basketball, but by borrowing her "rose is a rose is a rose" line, and adapting it a lot, maybe we can say that "murder is murder is murder." How else can you describe what the Transportation Road Runners did to Propulsion on that night of infamy, January 20?

The two teams came out for a friendly bounce-the-ball and hit-the-hoop game at a local court. If the judge was in court, he closed his eyes. A valiant (that is, out-gunned) Propulsion five sneaked in 29 points as the "murderers" netted 101. Yep, **101!** Decency and goodwill abandoned the scene as five T. R. Runners hit in double figures—Gary Pike and Wes Douglas leading the mayhem with 28 and 21 points, respectively. The crusher came later as Runners manager Jim Verteramo called it "Balanced scoring." Oh.

On the other hand, though, Propulsion's been practicing this sort of thing. Word is that on the night of the 13th they dunked in 35 points and the Spoilers scored 107. On that occasion, too, five men on the winning team finished in double figures; Lee Gedron hit for 28 and Ray Schaefer for 23 to lead the Spoilers.

In more serious vein, the T. R. R.'s have played some solid basketball, and they've felt the heat. The Tigers snarled at them before dropping a 67-52 decision. Wes Douglas, Bob Scully, and Vince Clerico were the big men for the Runners.

But (aside from their one loss) the Runners got into the hottest water in a game with the Spoilers, who'd dumped them earlier, 77-50. And it looked as though the Spoilers were going to do it again as they held a nine-point lead with about 5½ minutes to go. The Runners fought to within a one-point deficit, held onto the ball until the last seven seconds and — Wes Douglas got two points with a jump shot. With two seconds left, a Spoilers in-bounds pass was intercepted by the Runners' Gary Pike. Final: Runners 84, Spoilers 83.

There are other teams in the league, as Bob Schmidt of the DACS reports. His squad, down to just two men because of foul-outs, near game's end, nevertheless overcame Research, 89 to 79.

Call entries for 1971 billiards tourney

Two former champions are expected to participate in the 1971 men's pocket billiard tourney starting Thursday, February 25, at the House of Lords in Hicksville.

Elimination games (one loss and you're out) are based on a 75-point game. When the field is reduced to eight players, each game will consist of 100 points and elimination will be after two losses.

Tony Scura and George Massey, winners in 1970 and 1969, are ready to compete, says tourney director Mike Cherry of GAA. If you want to chalk cues with them, fill out the entry blank on this page and mail it to GAA, Plant 28B. The entry deadline is February 19.

Billiards Tourney Entry

Name ..... **Ext.** .....

Perm. No. ..... **Dept.** ..... **Plant** .....

Forward to GAA Office, Plant 28B, Bethpage

Entry deadline - Friday, February 19, 1971

Shepard, Mitchell, Roosa ready for Apollo 14 mission

(Continued from page 1)

scheduled events, such as the EVAs, occur during daylight hours in the eastern half of the nation.)

Shortly after midnight a week from today, the LM (Antares) and the CSM (Kitty Hawk) are to have parted. Lunar touchdown is to take place at about 4:16 a.m. And the first EVA is planned to begin at 9 a.m., almost 109 hours after launch. It's to run 3½ or four hours.

Longer work periods

The second EVA is to start at about 20 minutes before 6 a.m. Saturday, and could run as long as four or five hours. For the sake of comparison, previous EVAs have lasted about 2½ hours. Shepard and Mitchell are in for quite a bit of walking!

Of course, these walks could hardly be looked upon as leisurely strolls through a rock garden (though there'll be rocks a-plenty). Work will be the order of the EVAs . . . setting up experiments, analyzing features of the moon's surface, gathering soil and rocks, etc., largely under the watchful eye of the TV camera.

This mission goes into more depth than the earlier ones. That's partly because we now know humans can function well in the moon's atmosphere, partly because (as far as we know) only three more manned lunar landings are planned, and partly because some new equipment is to be used.

For example, there's something called a "thumper." That will be used to make several impacts on the moon that, hopefully, will help to determine the nature and depth of the lunar crust. The idea is to set up seismic waves—a kind of lunar echo chamber to be read from earth.

Mortar-like charges will be implanted in the moon's surface at four different points. Long after the astronauts have returned to earth—perhaps up to a year later—the charges will be set off. The resultant seismic shock waves will be radioed back to earth, where scientists can get a better understanding of the lunar structure.

Moon transport

Then there's METS (Modularized Equipment Transport System), which the astronauts call the "rickshaw." That's a two-wheeled non-powered rubber-tired vehicle that can be pulled along the surface of the moon. It can be loaded with rocks and soil samples. The men hope to get as much as 70 pounds of lunar material.

In all probability, the rickshaw will be used on EVA 2, when the plan is to go to the rim of Cone Crater, some 400 feet away from the landing site. It is thought that the material at the rim of (or in) the Crater might differ from the "flat" portions of the moon. Geologists are especially interested in learning about that.

Another new bit of equipment will be planted on the moon: a laser retro-ranging-reflector. This one will be much larger than one placed there during an earlier mission. Its more than 300 reflecting surfaces will allow scientists anywhere in the world to bounce beams off the moon, thus permitting more and better measurements of earth-moon distances at various times.

Medical surveillance is also a part of the mission. While they're sleeping, an EKG (electrocardiogram) and ZPN (impedence neumogram) will be transmitted continuously from at least one of the Apollo crewmen.

What's going on out there in space is going to be pretty well covered by TV transmissions. The schedule calls for 45 minutes of what's called "housekeeping;" that's to be seen beginning at 8:30 a.m., Wednesday, February 3. The following day, there'll be about 15 minutes devoted to an overview of the Fra Mauro landing site.

TV action during the first and second EVA periods will last four hours, and seven hours and 40 minutes, respectively. The next long TV session is an in-flight demonstration set for about 7:55 p.m. to 8:25 p.m., Sunday, February 7.

The astronauts are very highly trained and have spent hundreds, if not thousands, of hours in simulators—perfecting their ability to perform a highly complex job. They are specialists in the finest sense of that word.

Veteran astronaut

Al Shepard, Spacecraft Commander, was graduated from the U.S. Naval Academy with a B. S. degree in 1944 and immediately was assigned to the destroyer Cogswell, deployed in the Pacific. He served several tours aboard carriers and also became a test pilot. He has logged more than 4,700 hours of flight time, almost 3,000 hours in jets.

At the ready. **Sitting mission-tall for Apollo 14 flight are Spacecraft Commander Al Shepard (C), and Lunar Module Pilot Ed Mitchell (R)—the two who're to walk on the Fra Mauro area of the moon—and Command Module Pilot Stuart Roosa, who'll be orbiting the moon. (NASA photo)**

He was selected as one of the Mercury astronauts in 1959 and was the first astronaut to make a space flight.

In 1969—following correction of a disorder in his inner ear—he was restored to full flight status and joined the Apollo 14 crew. He and his wife, Louise, have two children, Laura and Julie.

Holds PhD

LM Pilot Ed Mitchell can accurately be called a scientist, possessing a Doctor of Science degree in aeronautics/astronautics earned at the Massachusetts Institute of Technology. A native of Texas who now calls Artesia, New Mexico, home, his experience includes Navy operational flight—a total of 3,700 flight hours, with 1,600 flight hours in jets.

He joined the Navy in 1952, went to Officers' Candidate School at Newport, Rhode Island, and completed flight training in 1954. He flew from two carrier groups. He came to the Manned Spacecraft Center after graduating first in his class from the Air Force Aerospace Research Pilot School. He and his wife, Louise, have two girls, Karlyn and Elizabeth.

Aero engineer

Roosa, a Major in the Air Force, earned his B. S. degree in Aeronautical Engineering at the University of Colorado. He attended Gunnery School and later graduated from the Aviation Cadet Program at Williams Air Force Base, Arizona, where he got his flight training and commission. He's flown 3,900 hours in jets and 400 hours in prop-driven planes.

His family is made up of his wife, Joan, and four children: Christopher, John, Stuart Jr., and Rosemary.

All three men on the Apollo 14 mission have gone through rigorous training that, on occasion, has seemed repetitive and endless. It almost comes to doing tasks by rote—though that has to be qualified: They know their jobs so well that they're **flexible**, able to foresee problems and to make appropriate "corrections in the game plan" very rapidly.

If experience has any relation to success—and most of us believe it has—then the Apollo 14 trio are going to splash down at approximately 4 p.m. on Tuesday the 9th.

TV **will** be there! And many millions will experience a vicarious thrill that is matchless!

Some key events

Day	Date	EST	Event
Sunday	1 - 31	3:23 p.m.	Launch
		5:54 p.m.	Translunar Injection
		6:28 p.m.	Transposition/Docking
Wednesday	2 - 3	5:28 a.m.	LM housekeeping (TV)
Thursday	2 - 4	2:01 a.m.	Lunar Orbit Insertion
		6:14 a.m.	Descent Orbit Insertion
		7:23 a.m.	Landing Site View (TV)
Friday	2 - 5	0:19 a.m.	Undock and Separation
		4:05 a.m.	LM Power Descent Initiation
		4:16 a.m.	Lunar Touchdown
		9:00 a.m.	First EVA (TV)
Saturday	2 - 6	5:38 a.m.	Second EVA (TV)
		1:47 p.m.	Liftoff from Moon
		3:33 p.m.	Docking (TV)
		5:47 p.m.	Jettison LM
Sunday	2 - 7	7:53 p.m.	Inflight Demonstration (TV)
Tuesday	2 - 9	4:04 p.m.	Splashdown